

# FOREST CONTROL

A  
13.23  
In 81  
116

## by CONTINUOUS INVENTORY

"Today I have grown taller from walking  
with the trees."

...Karle Wilson

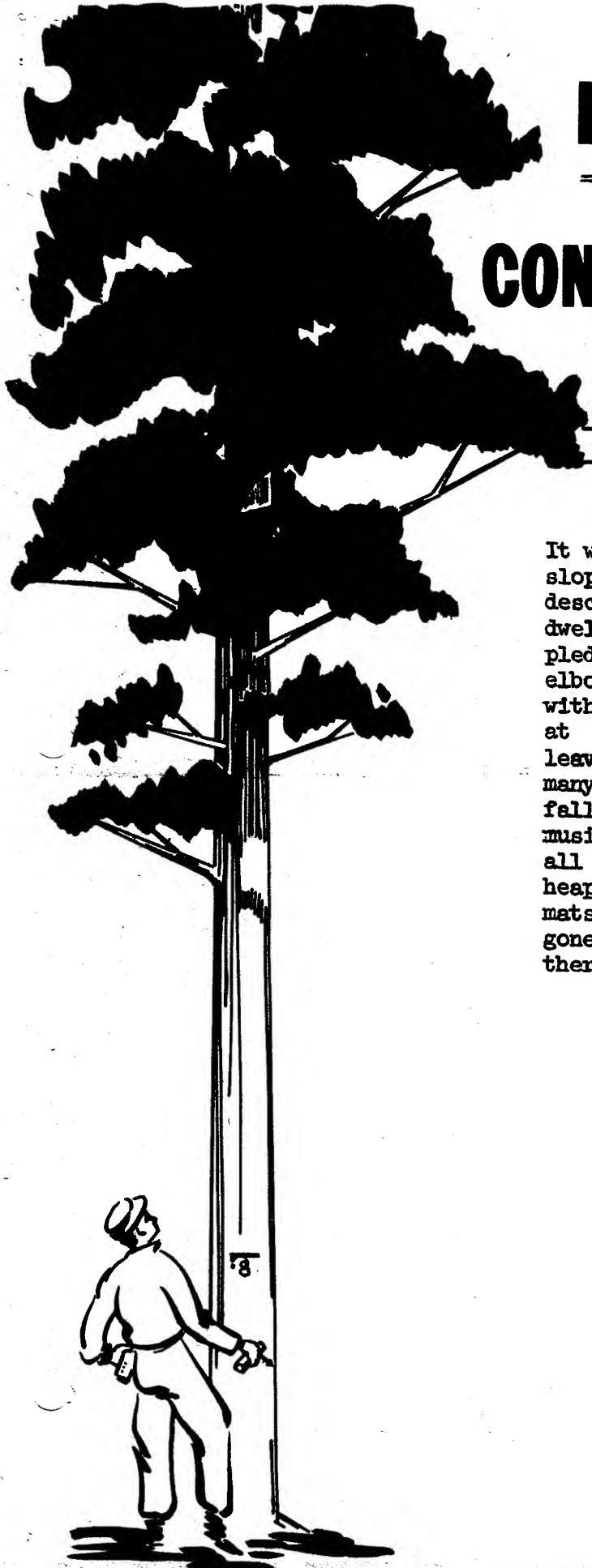
Milwaukee, Wis. November, 1963 No. 116

It was very pleasant there in the copse, sloping to the west as it was, and the sun descended brightly, with rocks and banks to dwell upon. The stems of mottled and dimpled wood, with twigs coming out like elbows, hung and clung together closely, with a mode of bending in, as children do at some danger; overhead the shrunken leaves quivered and rustled ripely, having many points like stars, and rising and falling delicately, as fingers play sad music. Along the bed of slanting ground all between the stools of wood, there were heaps of dead brown leaves, and sheltered mats of lichen, and drifts of spotted stick gone rotten, and tufts of rushes here and there, full of fray and feathering.

LORNA DOONE -  
A ROMANCE OF EXMOOR

By R. D. Blackmore

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## THE ROD GAUGE VERSUS THE U-GAUGE FOR MEASURING TOP DIAMETERS

The early part of the CFI season this year found us measuring usable lengths of sawlog and cordwood trees with a steel rod gauge on the end of a 32-foot pole. Later this rod was changed to a U-gauge caliper. Use of the two instruments gave us a fine opportunity to compare their relative efficiency.

The rod gauge was found to have many faults in application. One check plot found 10 cordwood trees out of 18 in error attributable directly to the rod gauge and its method of use. The length errors ranged from 2 to 14 feet and all were minus.

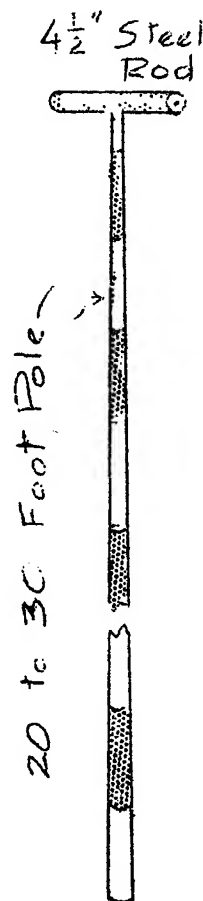
### THE ROD GAUGE IS INADEQUATE

The 4-1/2" steel rod attached to the upper end of a 20 to 25-foot or occasionally a 32-foot pole, is not a measuring device for upper diameters in pulpwood. It is merely a rough aid to judgment. The 9" rod gauge for sawlogs is also unsatisfactory.

Often the rod and pole are used by the cruiser when standing close to the tree. This is not a good procedure for the slightest movement of the head may radically change the perspective of the rod against the bole and cause an error of judgment in diameter.

When used correctly one man holds the pole and the other steps back 20 to 30 feet to judge when the rod is flush with the upper tree diameter. The length to this point is then measured with the graduated pole.

Used in this manner, the results are much better, but they still leave the cruiser with the unsatisfying realization that the answer he secures is not a measurement but only a conjecture. Furthermore, considerable time is needed to shift the pole and rod ends into position for judging diameters. A U-gauge caliper is used with a great deal more speed and results in greater accuracy refinement.



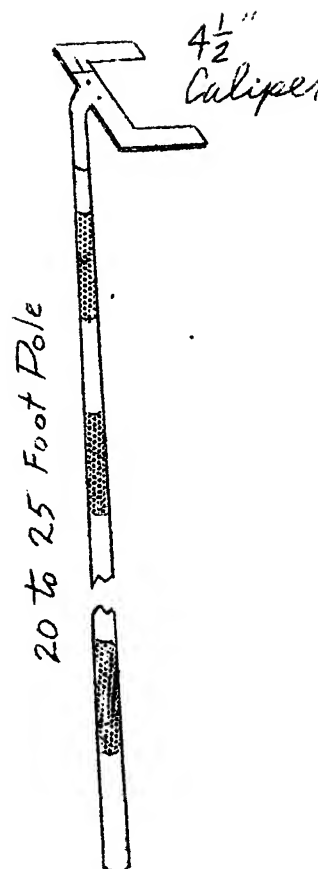
THE U-GAUGE CALIPER WORKS FINE \*

The U-gauge caliper, made from an Aluminum compound,\*\* is light in weight and strong. There is little play in the arms of the caliper and it is a reasonably true diameter measuring device. The U-gauge caliper does not require ocular positioning in use. The point on the bole where the caliper fits the trunk is the point of measurement for the usable length. It is satisfactory to use either the highest or the lowest gauge point on the bole for the length measurement. Very often there is a 3 to 6-foot range of length within which the gauge will fit the bole.

In addition to length and diameter determination the U-gauge and pole may be used to measure the length of cut-out sections in the upper trunk. Since the pole is graduated it is helpful in log grade decisions.

The implement does not require two men to operate successfully. Working along the cruiser may hang the caliper over a limb or stub 25 to 30 feet and sometimes 36 feet above the stump. This length then becomes a base from which to estimate or measure the remaining usable length which is above the measurable portion. It is common practice to estimate added lengths up to 10 feet above the pole but to hypsometer anything in excess of this length.

Since more than half of the pulp and sawlog trees in the Lake States and Central States are less than 32 feet in usable height, the measuring pole and gauge have a momentous refining effect on length records. It is a reliable measuring device and much faster than the steel rod gauge.



CAL STOTT  
Forester, Region 9  
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\* Refer to CFI Newsletter  
No. 87 for gauge  
dimensions

\*\* Federal specification No. QQA-318c  
AMS - 40170, Aluminum 5052 - H-34 or equivalent

### TREE QUALITY GRADING AND BUTT LOG DIAMETERS

Grading log quality in standing hardwood timber has come to be an important part of many inventory control cases in the Lake States and Central States regions. The grading rules developed from Forest Products Laboratory exploratory work are quite standard, yet they often vary in application. One of the problems in using the rules is securing precise dimensional information on the standing tree being graded.

Log grading rules should be applied with the same scientific care with which they were originally developed. Top diameters of logs and distances between defects in borderline cases should be meticulously measured. Ocular judgment is not good enough.

#### DETERMINING THE TOP DIAMETER INSIDE BARK FOR THE LOG TO BE GRADED

Woods decisions on the inside bark diameter of logs graded in the standing tree are often critical decisions. They may be guided by rules of thumb on taper but this should not be the controlling decision. Borderline cases in particular should be subjected to more decisive methods. Allowances must be made for exceptional taper variation, extreme differences in bark thickness by species and perhaps other influencing factors. Actually measuring the top diameter of the log in the standing tree is the best method of allowing for either minor or extreme variations in taper rate. This measurement has been given a 500 tree trial in the woods and found to be both convenient, corrective and eminently successful. The work was guided by rules of thumb given in table form but final decisions on DIB were based on 2 caliper measurements made at right angles on the small end of the log. Bark thickness variations were given some allowance in marginal cases.

#### HARDWOOD SAWLOG TAPER GUIDES FOR QUALITY 1 AND 2 BUTT LOGS \*

MINIMUM	:	:	CORRESPONDING MINIMUM DBH				:
DIB	:	LOG	FOR EACH STANDING LOG LEN.				GIRARD
SMALL END	:	GRADE	16'	14'	12'	10'	FORM
OF LOG	:	:	DBH OF TREE IN INCHES				CLASS
10		2	13.0	12.6	12.2	11.8	77
11		2	14.3	13.8	13.3	12.8	77
12		2	15.6	15.0	14.4	13.8	77
12		1	15.0	14.6	14.1	13.6	80
13		1	16.2	15.8	15.3	14.8	80
16		1	20.0	19.4	18.8	18.2	80
20		1	25.0	24.2	23.5	22.7	80

\*Modified from Service Forester Handbook,  
U. S. Forest Service, 1962

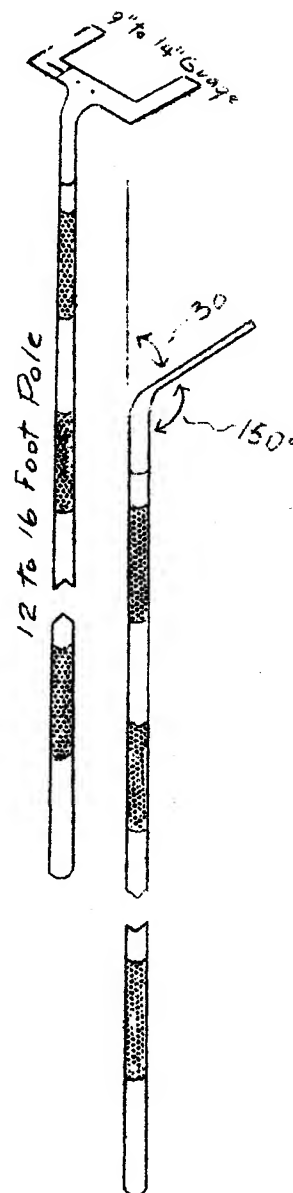
This fall about 500 sawlog hardwood trees were graded using an adjustable caliper. \* The U-gauge was mounted on a 16-foot bamboo pole.

Each tree of borderline grade size was calipered at the small end of the butt log, DOB. Two measurements were made at right angles. Comparative checks were made with taper guides. It seemed clear that the taper guides, if rigidly followed, as they sometimes are by unwary cruisers, upgraded the number 2 and 3 logs. No volumetric measure of the effect of this on grade recovery has been made.

The adjustable caliper was not much more time-consuming in use than referring to the DBH values in the taper guide, and ocularly correcting for taper variations above or below the guides. There was some inconvenience in dragging both the grading caliper and the 24-foot total usable length gauge from tree to tree and plot to plot, but this became less irksome once the full benefit of the two poles was fully realized. The large caliper was strong enough to withstand breakage and it never came out of adjustment.

On sawlog quality grading in CFI cases of the future, I am convinced of the need for this gauge. DOB measurements of the butt log of all hardwood trees near the marginal hardwood grade limitations is essential. Judgment, even guided by taper rules, is not likely to be good enough for 10% to 20% of the trees. The only safe way to make valuation surveys and develop tables of growth by grade information is to caliper all questionable butt log diameters outside of the bark at the top end of the log. It is incorrect to use taper guide values alone, without correction. We find that cruisers have a tendency to do this if not cautioned against it.

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\* Refer to sketches in Newsletter #87

\* Federal specification No. QQA-318c - AMS - 40170, Aluminum 5052 - H-34 or equivalent